



NASA ASTROBIOLOGY INSTITUTE ANNUAL REPORT YEAR 4

[July 2001 – June 2002]

Project Report: Delivery of Organic Materials to Planets

Director: Malcolm Walter

Associate Director: Jeremy Bailey

Executive Officer: Carol Oliver

The Australian Centre for Astrobiology (ACA) was formally established in July 2001 with a ceremony at Macquarie University presided over by the Vice-Chancellor Prof Di Yerbury. Dr Rose Grymes, Deputy Director of the NAI, and about fifty others, attended the ceremony. The Vice-Chancellor, Professor Bruce Runnegar, astronaut Dr. Andy Thomas and hoards of enthusiastic supporters will formally open the Centre's new premises on November 29, 2002.

An Advisory Board has been established and is chaired by Emeritus Professor S. Ross Taylor. It had its inaugural meeting in May 2002.

Work has begun that focuses on the research strengths of the ACA, particularly in the areas of ecogenomics and evogenomics of extremophiles, microbial palaeobiology of hydrothermal systems, hyperspectral infrared techniques for mineral mapping of hydrothermal systems, origins of life studies, theoretical physics, mapping the planets using ground-based telescopes, and the chirality of interstellar molecules.

Recent and current projects include:

- ? the ecogenomics of a radon-rich hot spring in South Australia
- ? the paleobiology of the 1.64 Ga McArthur River Pb/Zn/Ag deposit of the Northern Territory
- ? hyperspectral infrared mapping of the Paleozoic Mt Painter hydrothermal deposit in South Australia
- ? assessing the environmental and biological effects of the 580 Ma Acraman impact in South Australia
- ? mapping the atmospheric structure and airglow features of Venus
- ? direct detection of extrasolar planets by polarimetry
- ? re-examining the astronomical fine-structure constant and proposing changes with time of the speed of light

Undergraduate courses in astrobiology have been established at Macquarie University and the University of New South Wales, and the postgraduate student body is growing. The strategy for building the Centre focuses on postgraduate students and post-doctoral researchers. An exchange program for students and senior scientists is planned.

An extensive web site has been established (<http://aca.mq.edu.au>) to describe ACA activities, opportunities, and news.

ACA has played a major role in running three conferences: Astrobiology in Australasia (July 2001), the International Astronomical Union's Symposium 213 Bioastronomy 2002 Life Among the Stars and the Fulbright Commission's 2002 Symposium Science Education in Partnership (run concurrently in July 2002). A special issue of the journal *Astrobiology* derived from the first of these is in press.

In the public outreach area the Centre generated a total of about 500 media interactions nationally and internationally during the year. Member of the Centre Prof Paul Davies won the Royal Society's Faraday Award for communicating science to the public. The Centre has played a key role in developing a traveling exhibition 'To Mars and Beyond: Search for the Origins of Life'. Up to July 2002 there were more than 60,000 visitors to the exhibition at the National Museum of Australia in Canberra. Malcolm Walter is the curator. The Centre held a panel discussion public event in association with the Australian Museum in Sydney in July 2002 entitled 'Is the universe made for life?'. It attracted around 500 to the Seymour Centre at Sydney University. The panel participants were Dr Vikki Meadows (JPL), Prof Malcolm Walter (ACA), Prof Paul Davies (ACA) and Dr Seth Shostak (SETI Institute).



Postgraduate with spectrometer in the field